National Aeronautics and
Space Administration

EDUCATIONAL PROGRAM

EDUCATORS & STUDENTS | GRADES 3-12

EP-1999-07-367-HQ

# NASA Student Involvement Program

## 1999-2000


The NASA Student Involvement Program (NSIP) is a national program of investigations and design challenges. NSIP links students directly with NASA's diverse and exciting missions of research, exploration, and discovery. By participating in these competitions and learning activities, students design space missions, investigate Earth from space, explore Earth systems in their neighborhood, and learn about the latest developments in aeronautics, and Earth and space exploration. NSIP is a wonderful opportunity for students to learn science by doing science.

## Five National Competitions

| | GRADES | | |
|---|---|---|---|
| | 3-4 | 5-8 | 9-12 |
| Design a Mission to Mars (page 2) | | team | team |
| Watching Earth Change (page 3) | | team | individual |
| Earth Systems in My Neighborhood (page 4) | class | | |
| Aeronautics & Space Science Journalism (page 5) | team | team | team |
| Flight Opportunities (page 6-7) | | | team |

## Learning Goals Aligned with National Education Standards

The NSIP program is designed by scientists and educators to assure scientific accuracy and educational power. The NSIP program supports the National Standards for science, mathematics, technology and geography.

## By participating in NSIP, students:

- learn core concepts of Earth and space science
- apply computer and Internet skills
- develop "science as inquiry" skills
- work collaboratively as team members
- integrate science, mathematics, technology and geography skills
- communicate more clearly and effectively

## Judging

All entries will be submitted to NSIP and then judged at one of the following NASA Center locations:

1. Ames Research Center, Dryden Flight Research Center, or Jet Propulsion Laboratory
2. Goddard Space Flight Center
3. Johnson Space Center
4. Kennedy Space Center
5. Langley Research Center
6. John Glenn Research Center at Lewis Field
7. Marshall Space Flight Center or John C. Stennis Space Center
8. Wallops Flight Facility

Teams of scientists, engineers, educators, and journalists at each of the seven NASA judging sites will select winners for each competition category, except for Flight Opportunities (see below). Each competition category for each designated grade level (3-4, 5-8, 9-12) is judged separately. This will produce winners for each category for each Center. NASA Center education representatives will notify first, second, and third place winners of their achievement.

First-place winners in all grade 5-8 categories will be further judged to select a national winner for each competition.

All Flight Opportunities entries will be reviewed by a single panel of judges. The top 15 entries for SEM and top 15 entries for Sub-SEM will be further judged at the NASA Wallops Flight Facility to select experiments for flight.

## Awards

**NSIP National Symposium for Center winners (grades 9-12) —** First place winners from each judging Center win an all expenses paid trip to Washington, DC for the NSIP National Symposium and Awards Ceremony May 6-10, 2000, for the student(s) and one teacher/advisor. Winners will present their NSIP research projects, participate in workshops, meet with their Congressional representatives on Capitol Hill, and celebrate during specially planned events.

**Space Camp for national winners (grades 5-8) —** First place winning teams at the national level win travel and a full scholarship to attend Space Camp in the summer of 2000.

**Flight Opportunity Week at the Wallops Flight Facility (WFF) for winners whose experiments are selected for flight. —** A maximum of 4 students on the team and one teacher/advisor win travel and room/board for 5 days at the WFF, Wallops Island, VA in the June of 2000.

**NASA programs for schools of Center winners (grades 3-4, 5-8) —** First place winners from each judging Center win a presentation by a NASA representative in their school. The NASA representative will present their awards during these school visits.

**NSIP medals for second- and third-place winners (all grades) —** Second and third place winners for each judging Center will receive NSIP medals which will be sent to the winners' schools for presentation by their teachers.

**Certificate for all participants —** Every student who enters the competition with a qualified, on-time entry will receive a certificate of participation.

## Getting Started

This NSIP Announcement includes all details needed to enter the competition, except for Flight Opportunities which requires access to the web site as listed on pages 6-7. An Educator's Resource Guide is available for each competition. These optional resources are available without charge.

**The NSIP web site** also offers additional information and linkages with other NASA sites. www.nsip.net

Please see page 13 for details on the Educator's Guides, NSIP web site, and other resources.

## Inquiries and Comments

This brochure contains all necessary information for submitting entries to the 1999-2000 NSIP competitions. The Educator's Guide(s) and the NSIP web site provide helpful background information, learning activities and resources for each competition. If you still have questions after reviewing these resources, please contact:

Attn: NSIP
TERC/Center for Earth and Space Science Education
2067 Massachusetts Ave.
Cambridge, MA 02140

**Email: info@nsip.net**

## KEY DATES IN THE NSIP PROGRAM

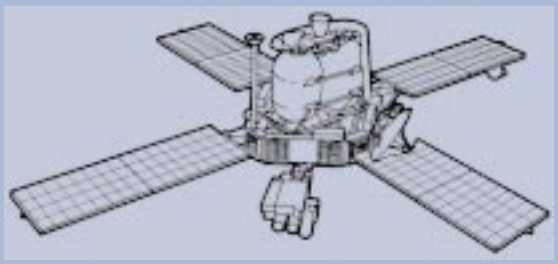
- **October 22, 1999 — Optional Letter of Intent for Flight Opportunity Entry**
- **February 1, 2000 — Entry deadline**
- **Mid-April, 2000 — Winners announced**
- **May 6 – May 10, 2000 — National Symposium**
- **Summer 2000 — Space Camp**
- **June 2000 — Launch Week**

GRADES 5-8, TEAMS OF 2-4
GRADES 9-12,TEAMS OF 2-4

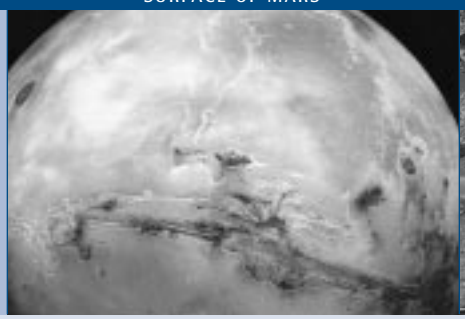
# Design a Mission to Mars

Write a proposal for a future mission to Mars. Define the Mars-related question(s) you want your mission to answer. Then design a mission to answer the question. You can design a robotic, orbital or sample return mission, or a human landing. Your mission will be judged on the scientific basis of your mission and on the appropriateness of the mission design. Include details, such as specific landing sites, orbital instruments and/or target sites for orbital study, as appropriate.

DRAWING OF MARS VIKING ORBITER



SURFACE OF MARS



MARS PATHFINDER

## Research Project Components

Develop a **Mars Mission Proposal** with the sections listed below. The maximum length is 1,500 words (excluding the Resource Credits), plus illustrations.

NOTE: See Resource List (page 13) for sources of Mars images and spacecraft information.

**I. Mission Purpose —** Define the Mars-related research question. Be brief, clear and focused.

**II. Background —** Describe what is known or theorized, why you are interested, and what science and engineering challenges are involved. Use a variety of sources about Mars and space missions.

**III. Mission Design —** Describe the science details of your mission, including the research focus, type of mission (robotic, orbital, human, sample return or other), data to be collected, target sites for landing or orbital study, and contingencies for "unknowns." Focus on the research goals and methods, rather than the engineering specifications. Briefly describe (but do not provide detailed designs for) the spacecraft, instruments and tools. Assume that the spacecraft has successfully reached the desired orbit or landing site. Include images and maps of Mars, illustrations and other data to convey concepts clearly. Include photos if you made spacecraft models.

**IV. Resource Credits —** List all reference books, periodicals, web sites, and people (including names, work titles, and type of help provided) contributing to the research basis and validity of your proposal. This section is not included in the word count.

## Judging Criteria

**Mission Design (40 points) —** Define the science research goal of your mission and describe the instruments, spacecraft and mission design.

Judges will look for:

1. specific mission goal(s) (10 pts.)
2. effective mission design (10 pts.)
3. selection of appropriate instruments (10 pts.)
4. creativity and originality (10 pts.)

**Research Basis (30 points) —** Demonstrate that your mission goals and design are based on research about Mars and space missions.

Judges will look for:

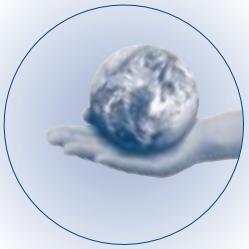
1. scientific validity (10 pts.)
2. depth of research (10 pts.)
3. understanding of core concepts (10 pts.)

**Communication (30 points) —** Convey the science concepts and the mission design clearly and persuasively.

Judges will look for:

1. clear organization (10 pts.)
2. effective use of language and graphics (10 pts.)
3. persuasiveness (10 pts.)

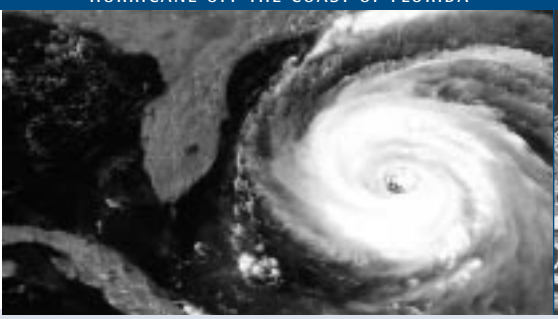
GRADES 5-8, TEAMS OF 2-4
GRADES 9-12, INDIVIDUAL



Use images of Earth (from satellites, astronaut photos or aerial photography) to identify and illustrate ways that the Earth changes over time. Any type of change in the Earth's surface or atmosphere qualifies, whether it is natural (such as weather, volcanoes or floods) or human-induced (such as growth of cities, agricultural adaptations or pollution). Identify features seen in the image(s) and describe how and why the area shown is changing.

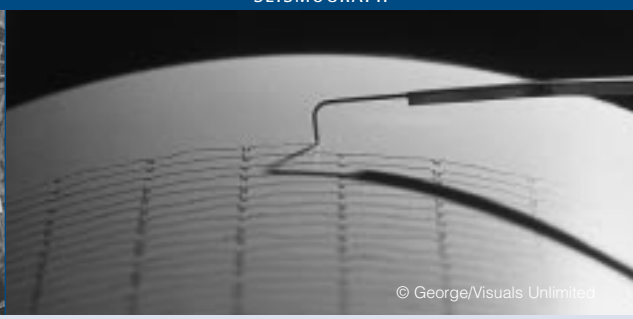
# Watching Earth Change

HURRICANE OFF THE COAST OF FLORIDA



WASHINGTON, DC

SEISMOGRAPH





## Research Project Components

Develop an **Earth Change Analysis** with the sections listed below. The maximum length is 1,000 words (excluding the Resource Credits), plus labeled images.

NOTE: See Resource List (page 13) for sources of Earth images.

**I. Focus of Investigation —** Select one type of natural or human-induced change for your project. Briefly describe the general nature, causes and impact of this type of change, and why you are interested.

**II. Image(s) with Labels —** Provide a print or photocopy of the image(s) used in your investigation, with key features labeled. State the location (latitude and longitude), date(s), time(s) (if appropriate) and type of instrument or sensor (such as Landsat satellite or astronaut photo). Provide a map or brief description of the region around the image(s), so that the reader understands the larger context.

**III. Analysis and Discussion —** Discuss how the region has changed over time and how it might change in the future, specifying the evidence found in the image(s). You may choose one of the following approaches: 1) compare images obtained at different times (hours, days or years apart), 2) infer change from a single image correlated with other data such as ground-based measurements, historical maps or field trip. Specify your approach.

**IV. Resource Credits —** List all reference books, periodicals, web sites, and people (including names, work titles, and type of help provided) contributing to the research basis and validity of your analysis. This section is not included in the word count.

## Judging Criteria

**Earth Change Analysis (40 points) —** Present labeled image(s) and a written discussion to illustrate one way that the Earth changes, as seen from space or aerial photography.

Judges will look for:

1. clear description of the selected topic (10 pts.)
2. well-captioned image(s) (10 pts.)
3. plausible analysis of the change (10 pts.)
4. creativity and originality (10 pts.)

**Research Basis (30 points) —** Demonstrate that you used the image(s) as research data, along with other sources of information.

Judges will look for:

1. effective use of evidence in the images (10 pts.)
2. scientific validity of the analysis (10 pts.)
3. depth of research (10 pts.)

**Communication (30 points) —** Convey the science concepts and Earth change analysis in a way that is clear, accurate and engaging.

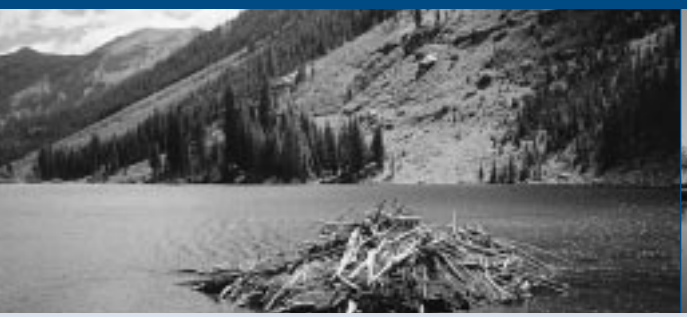
Judges will look for:

1. clear organization (10 pts.)
2. effective use of language and graphics (10 pts.)
3. creativity and originality (10 pts.)

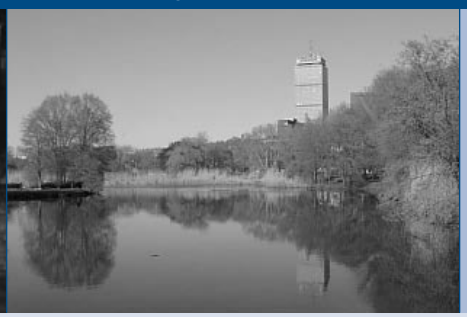
# Earth Systems in My Neighborhood

Select, observe, and describe a local study site, focusing on how the parts (land, water, air and life) are connected. Use field notebooks to make drawings of the site and record observations. Measure the size and number of trees, bodies of water, and so on. Develop explanations, conclusions, and questions for further study. Prepare an illustration and a written report which describes the study site and how the key components interconnect.

LAKE WITH BEAVER DAM



URBAN PARK



INTERDEPENDENCY


## Research Project Components

Develop a **Study Site Report** with the sections listed below. The maximum length is 1,000 words (excluding the Resource Credits), plus illustrations. This is an integrated class report, not a compilation of many student reports.

NOTE: See Resource List (page 13) for sources of Earth systems information.

**I. Study Site Description —** Select a study site near your school. Provide one or more visual representations (drawing, map, photo and/or diagram) and a written description of the study site. Select as natural a site as possible, no larger than 100 x 100 meters. Urban schools might select a local park or study the systems and connections in their urban, populated environment.

**II. Earth Systems at the Site —** Describe the components (land, water, air, and life) you observed and how they interconnect. Present this in a simplified illustration of the key components with labels and arrows to show the connections, along with a written description. Also describe how you conducted your research – how often you visited the site, how you recorded observations and what measurements you made.

**III. Resource Credits —** List all reference books, periodicals, web sites, imagery, and people (including names, work titles, and type of help provided) contributing to your investigation and Earth systems discussion. This section is not included in the word count.

## Judging Criteria

**Earth Systems in Your Study Site (40 points) —** Use visual representations and written discussions to describe your study site, including how the parts (land, water, air, and life) interconnect.

Judges will look for:

1. clear description of the study site (10 pts.)
2. accurate analysis of parts and connections (15 pts.)
3. understanding demonstrated in visual and verbal representations (15 pts.)

**Research Basis (30 points) —** Research the parts and connections in the site by observing, drawing, measuring and analyzing data.

Judges will look for:

1. field observation techniques (5 pts.)
2. data collection techniques (5 pts.)
3. analysis of data from observations and measurements (10 pts.)
4. scientific validity (10 pts.)

**Communication (30 points) —** Use visuals and written discussions to communicate clearly.

Judges will look for:

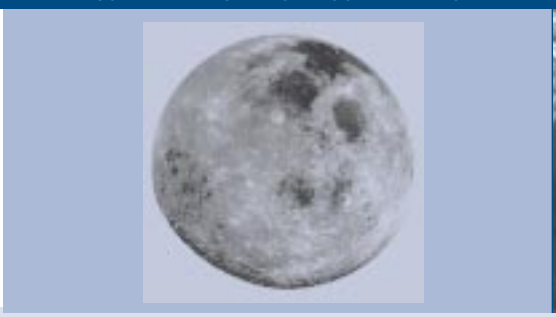
1. clear organization (10 pts.)
2. effective use and integration of words and graphs, diagrams, or other visual representations (10 pts.)
3. creativity and originality (10 pts.)

GRADES 3-4, TEAMS OF 2-4
GRADES 5-8, TEAMS OF 2-4
GRADES 9-12, TEAMS OF 2-4

# Aeronautics & Space Science Journalism

Select a newsworthy current event or on-going story about aeronautics, or Earth and space exploration, and prepare a news report for the general public. NASA's aeronautics and space science programs are rich with topics for journalism, such as astronauts conducting experiments on the Space Shuttle, celebrating the 100th anniversary of flight, celebrating the 30th anniversary of the first Moon landing, designing a new high-speed airplane, building the International Space Station, or making discoveries on another planet.

30TH ANNIVERSARY OF MOON LANDING



INTERNATIONAL SPACE STATION

EXPERIMENTAL PLANE


## Research Project Components

### I. Develop a News Report in one of the following media:

**Print**: submit an article of 1,000 words or less, plus relevant photos, illustrations or other graphics, laid out for publication.

**Cassette audio tape**: submit a five-minute (maximum) report in your choice of format (e.g. feature broadcast, news bulletin, interview, or talk show).

**VHS videotape**: submit a five-minute (maximum) report in your choice of format (e.g. newscast, investigative or special report, or documentary).

### II. Separately, submit supportive documentation, with two sections:

**a. Investigation and Production Methods** Describe the techniques used to gather information or opinions expressed, and the methods and equipment used in report production (maximum length 250 words)

**b. Resource Credits** — List all reference books, periodicals, web sites, imagery, and people (including names, work titles, and type of help provided) contributing to the research basis and validity of your news report.

NOTE: See Resource List (page 13) for sources for news.

## Judging Criteria

**Story Development and Analysis (40 points)** — Prepare a news report on a current event in aviation, Earth or space science, including the "big ideas" which the event represents.

Judges will look for:

1. strong story line (10 pts.)
2. objectivity and accuracy (10 pts.)
3. relating event to "big ideas" (10 pts.)
4. appropriate use of format (5 pts.)
5. creativity and originality (5 pts.)

**Research Basis (30 points)** — Use multiple sources and check for accuracy of information for your news report.

Judges will look for:

1. accuracy of information (10 pts.)
2. depth of research (10 pts.)
3. use of multiple sources (10 pts.)

**Communication (30 points)** — Convey the event and big ideas in a way that is clear, accurate, and engaging.

Judges will look for:

1. clear organization (10 pts.)
2. engaging tone (5 pts.)
3. effective use of format (5 pts.)
4. clarity of audio or video tape (5 pts.)
5. creativity and originality (5 pts.)

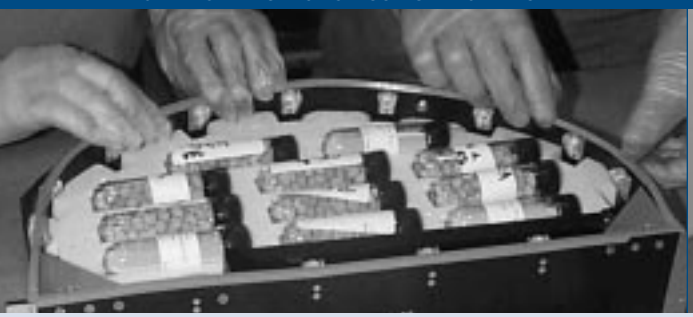
**Bonus Points for Publication**
Five bonus points will be awarded if your article, audio or video was presented to a real audience (such as a presentation in your school, community organization, or local media). You must provide either a copy of the printed article, or a letter signed and dated by a responsible official confirming the audio or video presentation. Publication must occur before the submission deadline.

# Flight Opportunities

## Space Experiment Module
## Suborbital Student Experiment Module

Design an experiment to fly on the Space Shuttle or on a NASA sounding rocket. The Shuttle flight is particularly suitable for microgravity experimentation. The sounding rocket reaches above 99.8% of the atmosphere and is suited to experiments in physics, instrumentation, and atmospheric measurements. Judges will select finalists, and several of these experiments will be built by the project teams and flown in space.

LOADING THE SPACE CAPSULES INTO THE SEM



10 SEMS FILL A G.A.S CANISTER

SHUTTLE LAUNCH

## SEM

Space Experiment Modules (SEM) will be mounted in a standard carrier which will later be launched on the Space Shuttle. The active or passive experiment may weigh up to 2.7 kg and must fit in a D-shaped module which has a volume of about 5 liters and a height of 8 cm. The carrier provides a sea level atmosphere, electrical power, and data recording equipment. Astronauts will activate the experiments early in the orbiting portion of the Shuttle's flight. Experimental materials will be returned to experimenters within a few weeks of the Shuttle's return to Earth. Temperatures in the carrier may range as low as -20° C and as high as 60° C. Detailed safety requirements apply.

Internet email and web access are required for the selected projects to meet the launch requirements.

SEM:
**www.wff.nasa.gov/pages/sem.html**

## Sub-SEM

Suborbital Student Experiment Module (Sub-SEM) experiments will be launched on a NASA rocket to an altitude of 45 km, which is above 99.8% of the atmosphere. The experiments must be suitable for mounting in a 30 cm circle and be no higher than 22 cm. An access door on the side of the rocket can include a window or port. The experiment can use electrical power and data recording equipment supplied by the rocket. In some cases, NASA-supplied video recording equipment may be used. The rocket accelerates at up to 15 Gs during launch and spins at 4 revolutions per second, so experiments must withstand these loads and the flights are not suitable for microgravity experimentation.

Internet email and web access are required for the selected projects to meet the launch requirements.

Sub-SEM:
**www.wff.nasa.gov/pages/sub-sem.html**

## Research Project Components

Develop a Flight Experiment Proposal with the four sections listed below. Sections I - III are limited to a total of 1500 words.

**I. Scientific Objectives —** Describe briefly and clearly the purpose and potential benefits of the experiment. What research question will it help answer? Tell how you conducted (or will conduct) ground-based control experiments. Explain why orbital flight or rocket flight is important to this experiment.

**II. Technical Plan —** Describe the experimental apparatus to be used and any special hardware to be built. Provide a diagram of the experimental apparatus which shows the overall size, total weight, and materials used. Detail any use of electrical power, control signals, or data recording equipment supplied by NASA. Describe the sequence of events during the flight. Show that your experiment can function in spite of expected temperature variations, vibration of launch, and storage periods before and after launch. Describe ground testing prior to flight.

**Launch Schedule —** Selected project teams will build their experiments and mount them to NASA-supplied decks. NASA will cover expenses for 1 teacher/advisor and up to 4 student representatives of the project team to travel to the NASA Wallops Flight Facility for Flight Opportunity Week in June. SEM experiments will be installed in the carrier which will be scheduled for a Space Shuttle flight likely to take place during the next academic year. **SEM project teams will need to be able to complete their work without the participation of students who are seniors during the 1999-2000 school year.** SubSEM experiments will be installed in the NASA Orion sounding rocket. The rocket will be launched, weather permitting, while the teams are at Wallops Flight Facility.

**Optional Letter of Intent —** Project staff will provide feedback that can help you improve your entry if you submit a Letter of Intent of 500 words or fewer. Describe briefly the plan for your experiment according to Sections I - III of Research Project Components below. Send two copies of the letter with a self-addressed stamped business envelope (4" x 9 1/2") to be received by October 22, 1999 to:

NSIP-IGES
2111 Wilson Boulevard - Suite 700
Arlington, VA 22201
Attn: Letter of Intent for Flight Opportunity

Don't stop working on your project while you wait to hear. Project staff will respond in late November with brief feedback regarding the suitability of your project for flight and suggestions for improving your proposal.

An Educator's Resource Guide will be available in September.

Supplementary materials are available on the web sites (see bottom of page 6).

SUBSEM EXPERIMENT MOUNTING

FINAL PREP. ON LAUNCH PAD

SUBSEM ROCKET

**III. Team Organization —** The team that will travel to Wallops Flight Facility will be limited to 4 students and 1 teacher/advisor, but in general they will be representatives of the larger team which is necessary to carry out a successful experiment. In particular, teams should include students able to carry out, and faculty members able to assist with, the following kinds of tasks:

- Planning and coordinating the work,
- Building and testing experimental apparatus,
- Designing and conducting experiments, and
- Communicating the plans and results of the project.

Show how your team is prepared to carry out the experiment you propose, including the completion of the final report. If your experiment is selected for launch, how will classroom or club activities support the continuing work?

**IV. Resource Credits —** List all reference books, periodicals, web sites and people (including names, work titles, and type of help provided) contributing to your proposal. (This section is not included in the word count.

## Judging Criteria

In order to be selected as finalists for this year's launch, entries must demonstrate that the student team and faculty advisor(s) are prepared to build the experimental apparatus in time for Launch Opportunity Week.

**Scientific Objectives (30 points) —** Show that flying your experiment will address a relevant research question.

Judges will look for:

1. practical objectives (10 pts.)
2. scientific validity (10 pts.)
3. potential scientific benefits (10 pts.)

**Technical Plan (25 points) —** Show that you are ready to provide the experimental materials on schedule and that your design can provide useful data.

Judges will look for:

1. practicality of the plan (10 pts.)
2. suitability for construction (10 pts.)
3. likelihood of success (5 pts.)

**Team Organization (25 points) —** Describe the variety of skills team members contribute. Explain how your team manages to work together effectively.

Judges will look for:

1. relevant skill and experience (10 pts.)
2. effective cooperation (10 pts.)
3. broad base of support (5 pts.)

**Creativity, Originality, and Attention to Detail (20 points) —** NSIP values creative and original uses of the Flight Opportunities. Scrupulous attention to the Competition Rules suggests that teams will be able to meet all the requirements for a safe and successful launch.


# How to Enter

## Entry Components

1. One completed Entry Form
2. One completed student/team checklist
3. One completed teacher checklist
4. Two identical & complete versions of the Research Project (all components included)
5. Optional: Journalism entries only – one copy of presentation verification from principal or other school official for extra credit, stapled to the Entry Form
6. Optional: one self-addressed stamped envelope (4" x 9 1/2") stapled to the Entry Form, for judges' comments
7. One Educator Data Form

   (note: Each educator should submit only one Educator Data Form whether he/she has one or many students entering the competition.)

## Entry Submission

Entry must be received by
**February 1, 2000**

Send to:
NSIP-IGES
2111 Wilson Boulevard - Suite 700
Arlington, VA 22201

## NSIP COMPETITION RULES

1. Entrants must be students in grades 3-12.
2. If a team crosses grade level categories, the entry will be placed in the highest grade-level category.
3. Entrants must attach only one entry form for each research project.
4. Each entry must include one completed student/team checklist and one completed teacher checklist.
5. Each entry must include two identical and complete (all components included) copies of the Student Research Project.
6. The written component of the Student Research Project must be typed or computer-printed, double-spaced, using 12-point type, not bold or italic. Please leave 1 1/2" blank at the top of page 1.
7. The Student Research Project may not have a title page, folder, or other covers.
8. Student names, teacher name, or information about the school or sponsoring organizations should appear **only** on the entry form.
9. Each entry may include a self-addressed stamped envelope (4" x 91/2") stapled to the entry form, for judges' comments. Address envelope to student, c/o teacher at school address.
10. Entry form, educator data form (unless previously submitted), and all copies of the Student Research Project must arrive in a single package.
11. Late entries, entries sent by facsimile or electronic mail, and entries not complying with competition rules will be disqualified.
12. Entry materials will not be returned; retain a copy for your records if desired.
13. All judges' decisions are final.
14. Winners of trips to Space Camp, Flight Opportunity Week, and the National Symposium will be required to provide verification of their U.S. citizenship or legal residency.
15. Entrants must comply with each competition's participant requirement (team or individual).

# Entry Checklists

Mark each item as you prepare your package.
Submission of a completed checklist is required to accompany each entry.

## Student/Team Checklist

### Entry Form

- ❍ I/we have completed the entry form in only blue or black ink.
- ❍ I/we have checked one competition category on the entry form.
- ❍ I/we have checked the grade level for myself (and each member of my team if team entry).
- ❍ I/we have placed the project title identically on all components, including tapes.
- ❍ I/we have provided a project summary on the entry form.
- ❍ I/we have legibly listed the name of each entrant/team member.
- ❍ I/we have signed the entry in the block labeled "signature".

### Research Project

- ❍ It does not have student, teacher, advisor, or parent names on it anywhere.
- ❍ It does not have a title page, folder, or other covers.
- ❍ I am submitting print material in portrait format on 8 1/2" x 11" paper in 12 point double-spaced plain (not bold or italic) type for the body. (Journalism print entries may deviate from this size).
- ❍ I have left 1 1/2" of paper blank at the top of the first page of my research project (for NSIP labeling). [Note: This does not apply to Journalism print entries but does apply to Journalism supportive documentation.]
- ❍ I have kept a copy of my entire entry and understand that my entry will not be returned.
- ❍ I have had someone else proofread my entry for typing mistakes, misspellings, and incomplete sentences.

### Tape Entries - Journalism Competition Only

- ❍ I used VHS or audiocassette format tape.
- ❍ I am providing two tapes, labeled only on the spine and only with the project title and version (either original or copy) and have left space for NSIP to insert an entry number on the label.
- ❍ I have used new tapes that contain only my entry on side A (no outtakes, practice versions, tape-overs, multiple entries on single tape).
- ❍ I have checked the sound level and quality on both my tapes.

### Judging

- ❍ I have responded to the judging criteria for my competition and understand my entry will be judged against the criteria listed in the brochure.
- ❍ I understand judges will provide personalized comments for quality of work if a self-addressed stamped envelope is provided.

### Assembly of Entry

- ❍ Journalism only - I stapled only one copy of my presentation evidence to the back of the entry form at the upper left corner (if applicable; see extra credit requirements).
- ❍ I stapled each of the two copies of my research project in the upper left corner.
- ❍ Tapes have been placed in a clear plastic bag and then binder-clipped to the rest of the research project.
- ❍ I used binder clips or paper clips for, or placed in a separate manila envelope the following entry components: (1) my entry form, (2) signed student checklist, (3) signed educator checklist and (4) two copies of the research project (including tapes if appropriate).
- ❍ Optional: I have stapled a self-addressed stamped envelope to the entry form for judges' comments.

**Failure to follow instructions will result in disqualification.**

## Teacher Checklist

- ❍ My teacher information is listed identically on each entry form.
- ❍ I have signed the entry form.
- ❍ This student entry has been proofread.
- ❍ I have submitted only one educator data form for all my students' entries.
- ❍ If shipping multiple entries, each entry is separated from the others with binder clips or placed in its own manila envelope.

teacher signature

date

# Entry Form

Submit this entry form, the entry checklist, and 2 copies of the Student Research Project to:

**NSIP-IGES**
**2111 WILSON BOULEVARD - SUITE 700**
**ARLINGTON, VA 22201**

*(check one competition only)*

- ❍ **Design a Mission to Mars**
- ❍ **Watching Earth Change**
- ❍ **Flight Opportunities**
  check one only ❍ SEM ❍ Sub SEM
  I have sent a Letter of Intent ❍ Yes ❍ No
- ❍ **Earth Systems in My Neighborhood**
- ❍ **Aeronautics & Space Science Journalism**
  check one only ❍ audio ❍ video ❍ print

*(grade level — check all that apply)*

❍ 1 ❍ 2 ❍ 3 ❍ 4
❍ 5 ❍ 6 ❍ 7 ❍ 8
❍ 9 ❍ 10 ❍ 11 ❍ 12

*(school type — check one only)*

❍ **Elementary** ❍ **Middle** ❍ **High**

student project title _____

summary (maximum 50 words) _____

## Teacher Information

lead teacher/advisor ❍ Dr. ❍ Mr. ❍ Mrs. ❍ Ms. _____
First Name M.I. Last Name

second teacher ❍ Dr. ❍ Mr. ❍ Mrs. ❍ Ms. _____
First Name M.I. Last Name

school or sponsoring organization _____

address _____ city _____

state _____ zip ☐☐☐☐☐-☐☐☐☐ phone number (_____) _____

lead teacher/advisor's e-mail address _____

last day of your school year _____ Is your school a GLOBE school? ❍ Yes ❍ No
mm/dd/2000

We affirm that this entry for the 1999-2000 NSIP is original, and has been independently conceived and developed by the student members of the team. We further affirm that we have read and understand the rules of the NSIP competition, and understand that entries are the property of NSIP and may be used for publicity or outreach purposes. Copyrighted materials must be properly cited and tradedmarked materials are prohibited.

lead teacher's signature _____ date _____

## Student Information

total number of students submitting this entry _____

name of individual entrant or team member 1 _____ signature _____
Optional: ❍ female ❍ male ❍ Asian ❍ African American ❍ Caucasian ❍ Hispanic ❍ Native American ❍ Pacific Islander ❍ other

name of team member 2 _____ signature _____
Optional: ❍ female ❍ male ❍ Asian ❍ African American ❍ Caucasian ❍ Hispanic ❍ Native American ❍ Pacific Islander ❍ other

name of team member 3 _____ signature _____
Optional: ❍ female ❍ male ❍ Asian ❍ African American ❍ Caucasian ❍ Hispanic ❍ Native American ❍ Pacific Islander ❍ other

name of team member 4 _____ signature _____
Optional: ❍ female ❍ male ❍ Asian ❍ African American ❍ Caucasian ❍ Hispanic ❍ Native American ❍ Pacific Islander ❍ other

For entire class competition, attach a list of students' names and, optionally, gender and ethnicity. Please include all participants' signatures.

# Educator Data Form

Each teacher/adviser should submit only **one Educator Data Form** for all NSIP activities. These data are confidential, and not affect the judging. We need your help to improve in the future. Thank you.

**1.** Project title _____

**2.** Lead teacher's name _____

**3.** How many students participated in NSIP-related learning activities? _____ **4.** How many students submitted entries to the competitions? _____

**5.** Type of School/Organization: *(check all that apply)* ❍ urban ❍ suburban ❍ rural ❍ public school ❍ private school ❍ home school ❍ military school ❍ DoD school ❍ international school ❍ other

**6.** Percentage of students in free or subsidized lunch program _____

**7.** Subject(s) taught _____

**8.** I used NSIP in the following way(s): *(check all that apply)* ❍ curriculum integration ❍ class assignment ❍ extra credit ❍ special course ❍ assignment to selected students ❍ club ❍ other

**9.** Were the rules, guidelines, and entry materials in this NSIP program announcement brochure clear and complete? ❍ yes ❍ no

**10.** Were the judging criteria helpful in guiding your students concerning standards of excellence? Give an example to demonstrate how. _____

_____

**11.** How did you get the Educator's Resource Guide(s)? ❍ NSIP web site ❍ order on 800-number ❍ conference ❍ NASA Center ❍ other

**12.** Which Educator's Resource Guide(s) did you use? *(check all that apply)*

❍ Design A Mission to Mars
❍ Watching Earth Change
❍ Earth Systems in My Neighborhood
❍ Aeronautics and Space Science Journalism
❍ Flight Opportunities

**13.** Please rate how helpful was (were) the Educator's Resource Guide(s) in promoting the ways in which students

Develop science as inquiry skills ❍ 5 very helpful ❍ 4 ❍ 3 ❍ 2 ❍ 1 not at all

Work collaboratively as team members ❍ 5 very helpful ❍ 4 ❍ 3 ❍ 2 ❍ 1 not at all

Integrate science, mathematics, technology, and geography skills ❍ 5 very helpful ❍ 4 ❍ 3 ❍ 2 ❍ 1 not at all

Communicate more clearly and effectively ❍ 5 very helpful ❍ 4 ❍ 3 ❍ 2 ❍ 1 not at all

PRIVACY ACT AUTHORIZATION — The Government Performance and Results Act of 1993 requires that all Federal Agencies or Departments provide an annual evaluation of all programs in order to improve program effectiveness and public accountability. Disclosure of the information requested is voluntary. The information collected will be used to improve program delivery, and to compile the required annual report. Routine use of the information may be used to carry out follow-up evaluations to provide you with further information about similar programs. In accord with the Privacy Act of 1974, 5 U.S.C. 552A, personal information will not be released to any external organization unless express authorization is requested and provided. There is no effect to you, the participant, if you elect not to complete any or all of the information requested on this form.

**14.** Please rate the usefulness of the Educator's Resource Guide(s) you used. Please also list those sections in each guide you found most valuable. *(For example, list "Three Case Studies" under Earth Systems in My Neighborhood, and list "Map of Mars" under Design A Mission to Mars.)*

Design A Mission to Mars ❍ 5 very helpful ❍ 4 ❍ 3 ❍ 2 ❍ 1 not at all

Watching Earth Change ❍ 5 very helpful ❍ 4 ❍ 3 ❍ 2 ❍ 1 not at all

Earth Systems in My Neighborhood ❍ 5 very helpful ❍ 4 ❍ 3 ❍ 2 ❍ 1 not at all

Aeronautics and Space Science Journalism ❍ 5 very helpful ❍ 4 ❍ 3 ❍ 2 ❍ 1 not at all

Flight Opportunities ❍ 5 very helpful ❍ 4 ❍ 3 ❍ 2 ❍ 1 not at all

**15.** How would you like to see the Educator's Resource Guides improved? _____

**16.** What other materials and resources were especially helpful in your working with students to submit their entries? _____

**17.** Did you use technology (web access or other) to help you with your project? ❍ yes ❍ no In what way? _____

**18.** The NSIP web site is useful? ❍ 5 strongly agree ❍ 4 ❍ 3 ❍ 2 ❍ not at all

**19.** What part(s) of the web site did you find most useful? _____

**20.** NSIP increased students' interest in Earth and space science ❍ 5 strongly agree ❍ 4 ❍ 3 ❍ 2 ❍ not at all

**21.** NSIP improved students' understanding of Earth and space science ❍ 5 strongly agree ❍ 4 ❍ 3 ❍ 2 ❍ not at all

**22.** NSIP enhanced my teaching of science and technology ❍ 5 strongly agree ❍ 4 ❍ 3 ❍ 2 ❍ not at all

**23.** NSIP was a valuable experience? ❍ 5 strongly agree ❍ 4 ❍ 3 ❍ 2 ❍ not at all

**24.** Did the content of the project align with your curriculum? ❍ yes ❍ no

**25.** Do you intend to participate in NSIP next year? ❍ yes ❍ no

**26.** What recommendations would you make for future program design or improvement? _____

# Resources

## NSIP Educator's Guide

For FREE Educator's Guides:

- download from the NSIP web site, or
- call to request a printed copy (800) 848-8429, toll free

## NSIP Web Site

**www.NSIP.net**

## NASA Educational Resources

NASA has a multi-faceted education and public outreach program, including a comprehensive web site, printed educational materials, lithograph sets and other resources online.

NASA Home Page – www.nasa.gov
NASA Spacelink – spacelink.nasa.gov
The guidebook – "How to Access Information on NASA's Education Program, Materials and Services" (EP-1998-03-345 HQ) is available through Spacelink

For further information, contact your local NASA Educator Resource Center:

- Ames Research Center (CA) (650) 604-3574
- Dryden Flight Research Center (CA) (661) 948-7347
- Goddard Space Flight Center (MD) (301) 286-8570
- Jet Propulsion Laboratory (CA) (909)-397-4420
- Kennedy Space Center (FL) (407) 867-4090
- Johnson Space Center (TX) (281) 244-2129
- Langley Research Center (VA) (757) 727-0900
- Glenn Research Center (OH) (216) 433-2017
- Marshall Space Flight Center (AL) (256) 544-5812
- Stennis Space Center (MS) (228) 688-3338
- Wallops Flight Facility (VA) (757) 824-2297

### Design a Mission to Mars

Mars web sites, such as:

- JPL's Mars web Page – **marsweb.jpl.nasa.gov**
- Center for Mars Exploration – **cmex-www.arc.nasa.gov**
- NASA's Planetary Photojournal – **photojournal.jpl.nasa.gov**

Mars and astronomy books, such as:

- NASA Atlas of the Solar System, by Ronald Greeley
- Planets: A Smithsonian Guide, by Thomas Watters
- Uncovering the Secrets of the Red Planet, by Paul Raeburn

Posters of Mars (through local map stores), such as:

- Two Faces of Mars
- MarsScape
- Explorer's Guide to Mars

### Watching Earth Change

Earth web sites, such as:

- JSC's Earth from Space – **earth.jsc.nasa.gov**
- TerraServer – **www.terraserver.com**
- GOES weather images – **www.ssec.wisc.edu/data/**

Books with Earth images, such as:

- Orbit, by Jay Apt
- The Third Planet, by Sally Ride
- America From Space, by Thomas Allen
- Looking at Earth, by Priscilla Strain
- Historical Landsat Data Comparisons, by USGS

Posters with satellite images (through local map stores), such as:

- Global views of Earth
- Regional views (continents, countries, states, cities)

### Earth Systems in my Neighborhood

Earth systems web sites, such as:

- GLOBE – **www.globe.gov**

Books about Earth systems, such as:

- How the Earth Works, by John Farndon
- How Nature Works, by David Burnie
- Discover Nature Close to Home, by Elizabeth Lawlor

### Aeronautics and Space Science Journalism

News web sites, such as:

- NASA's home page – **www.nasa.gov**
- NASA's Image Exchange – **nix.nasa.gov**

Magazines on aviation and space, and books such as:

- Spaceflight: A Smithsonian Guide, by Valerie Neal
- Aviation: A Smithsonian Guide, by Donald Lopez

### Flight Opportunities

Flight Experimentation web site, such as:

- SEM Program – **http://sspp.gsfc.nasa.gov/sem/sem.html**
- NASA Wallops Flight Facility – **http://rfs.wff.nasa.gov**
- Sounding Rockets – **http://rfs.wff.nasa.gov/pages/soundingrockets.html**
- Microgravity – **http://microgravity.msfc.nasa.gov/**

Books about Flight Experimentations, such as:

- Microgravity Teachers Guide, NASA **http://spacelink.nasa.gov/Instructional.Materials/NASA.Educational.Products/Microgravity**
- Rocket Boys, by Homer H. Hickam Jr. (basis of the movie October Sky)

NOTE: Suggested resources do not imply endorsement by NASA

Launch an Experiment

Design a Mars Mission

Explore Earth From Space

Be a Science Journalist

Investigate Earth Systems

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